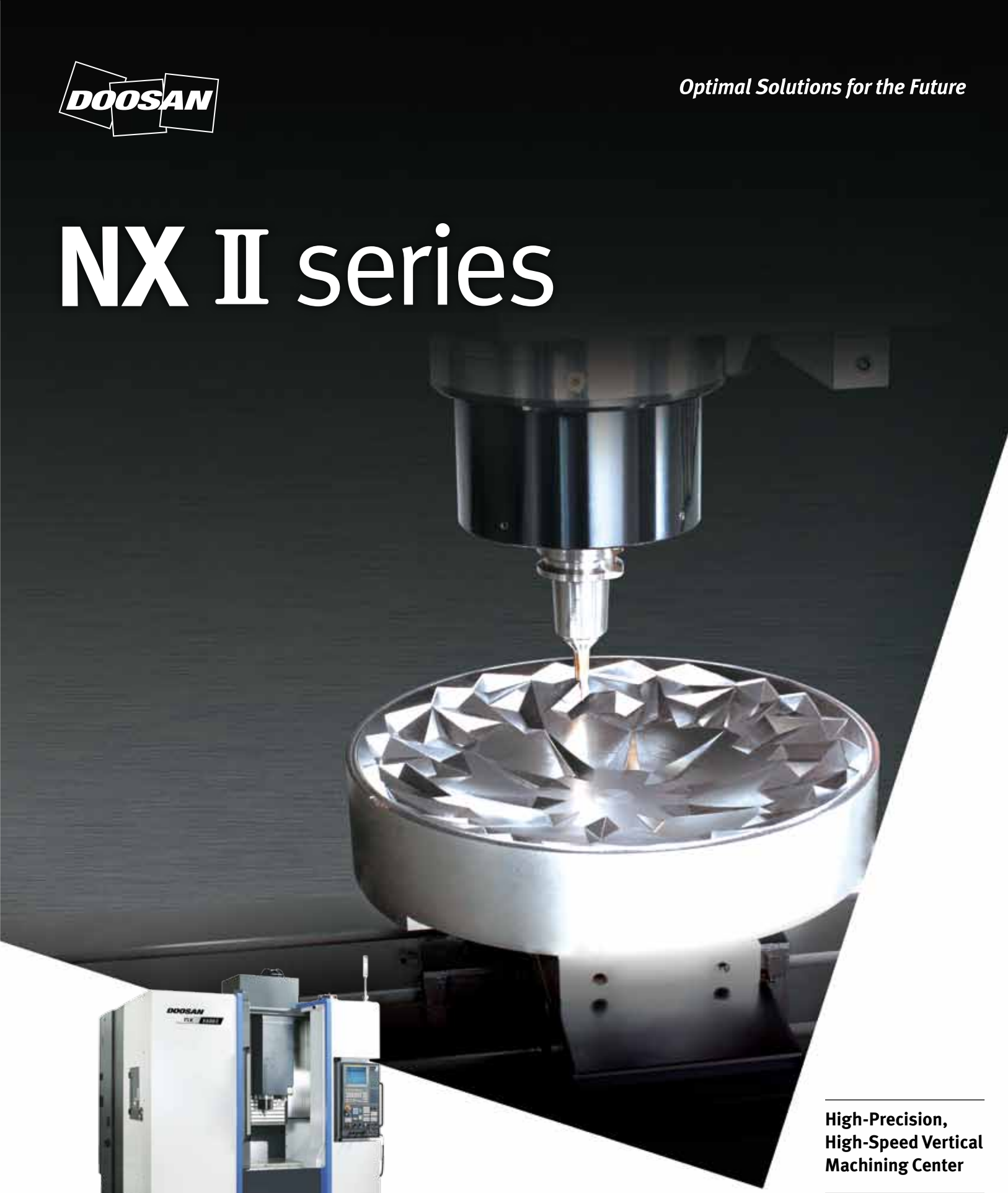
DOOSAN

Optimal Solutions for the Future

NX Ⅱ series



High-Precision, High-Speed Vertical Machining Center

NX Ⅱ series

NX 5500 Ⅱ
NX 6500 Ⅱ

ver. EN 160324 SU

NX Ⅱ series

The NX Ⅱ series vertical machining centers are designed with a thermal-symmetric bridge type structure to optimise precision and workpiece quality. High accuracy is also enhanced by the constant pre-load high speed spindle. Operator convenience is improved by optimum accessibility and operator functions.

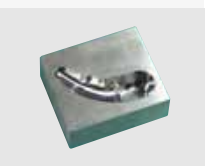
Contents

Sample work


Cellular phone


Pocket


Pet Bottle


Door Knob

Improved Spindle Rigidity and Life

Improved spindle rigidity in low speed range and achieved long spindle life with constant pre-load spindle in high speed range.

Stable bridge type structure

Thermal analysis of the symmetrical structure and minimal overhang of the bridge type machine structure provide optimal solution for high-speed / high-precision processing.

Optimized Mold Processing Solution

Thermal error compensation system, high speed spindle, high accuracy contour control, tool measurement system are provided as standard to improve mold processing performance.

Basic Structure

NX Ⅱ series have the Bridge type structure for high-performance, high-accuracy machining.

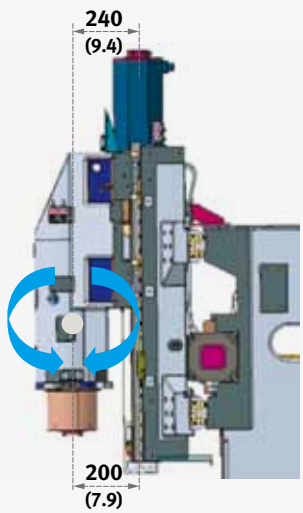
Bridge Type Structure

Thermal analysis of the symmetrical structure proves that this is the optimal solution for high precision machining of mild products.

Gravity Center Drive Structure

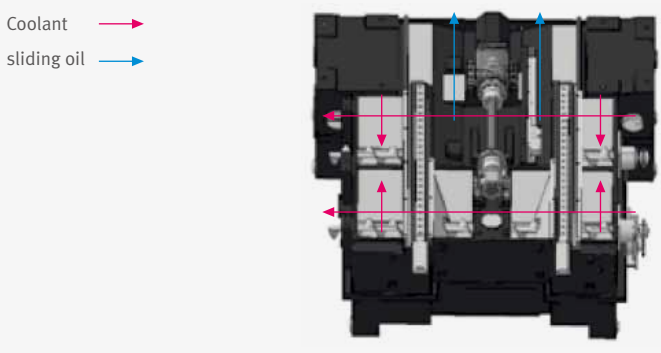
By minimizing the distance between gravity center and the feed drive center, the inertia movement is reduced allowing for faster feed rates and a more precise part.

Unit: mm (inch)



Oil Separator (NX 5500 Ⅱ)

Coolant separated in the bed structure.



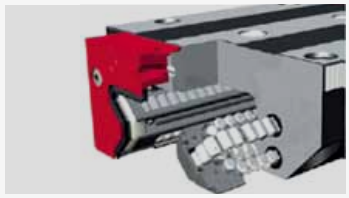
Feed Shaft

The linear axes are equipped with roller linear Guideways for increased rigidity and a cooling system as standard features to minimize thermal error.

High-precision Travel System

Roller-type linear Guideways, high-rigidity coupling, and nut cooling system achieve high rigidity and outstanding linear axis accuracy of linear feed drive system.

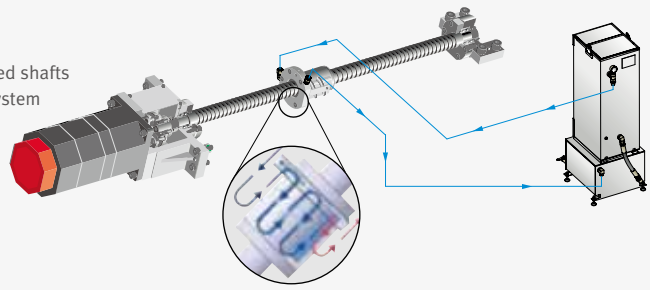
Roller linear guideway



Rigid coupling

Ball screw nut cooling

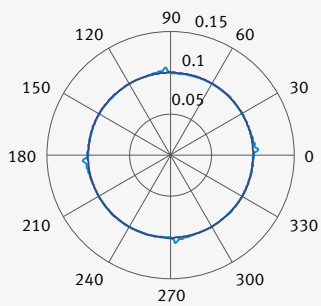
Reduced thermal error of feed shafts
Stable rigidity of the feed system



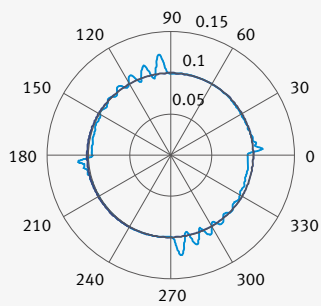
High Power Servo Motor

The responsiveness of each axis feed system is improved by reducing the load / motor inertia ratio by 50%.

NX Ⅱ series



General processing system



Tool Changer

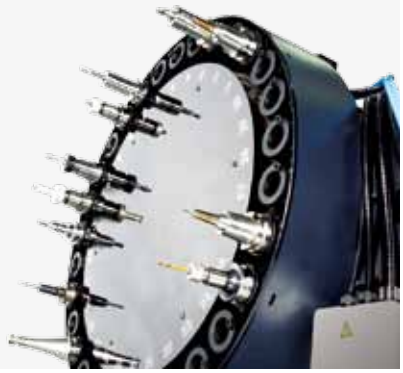
Rapid tool change reduce idling time and improves productivity.

Automatic Tool Changer

Enhanced productivity achieved with the high speed tool changer.

Tool storage capacity **30ea**

Tool change time **1.6s**

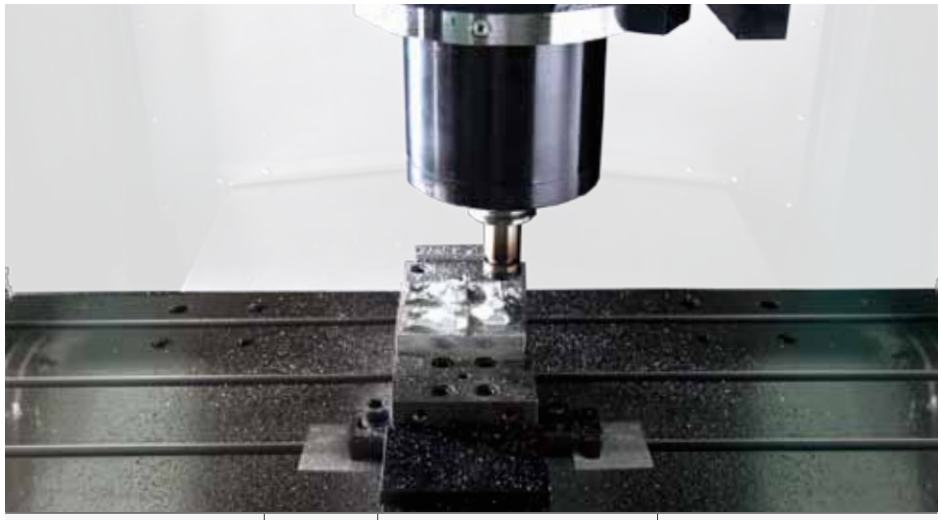


Table

Wide cutting area for cutting various workpieces.

Wide Cutting Area

The size and load capacity of the table allow the setting up and cutting of larger workpieces of various shapes.



Item	Unit	NX 5500 Ⅱ	NX 6500 Ⅱ
Table size	mm (inch)	1000 x 550 (39.4 x 21.7)	1200 x 650 (47.2 x 25.6)
Table loading capacity	kg (lb)	700 (1543)	800 (1763)

Spindle

High-precision spindle and excellent dynamic balancing ensures stable surface accuracy by minimizing vibration in high speed cutting.

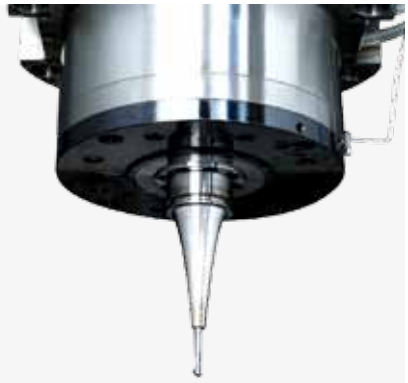
High-rigidity, High-precision Spindle

Adopting a new constant preloading structure, improved spindle rigidity in low speed range and achieved long spindle life.

Max. spindle speed

20000r/min

30000 / 40000 r/min Option



Spindle motor power

22 / 11kW (30 / 15 Hp)

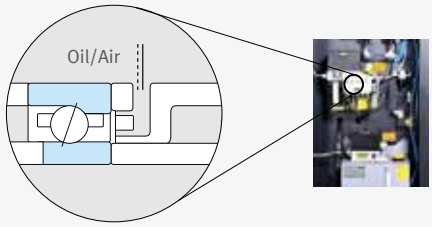
Spindle Type and Tool Specification

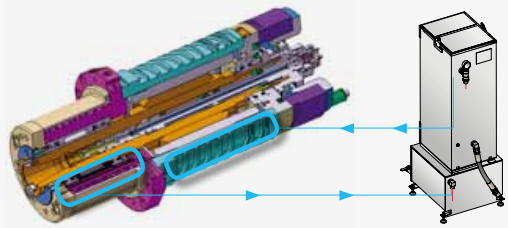
High speed spindle up to 40000 r/min can be selected according to the workpieces material and cutting conditions. Dual-contact spindle can be selected to improve surface roughness and extend tool life by firm mounting of the tools on the spindle.

Item	Unit	20000 r/min		30000 r/min option	40000 r/min option
		std.	opt.		
Spindle motor power	kW (Hp)	22 / 11 (30 / 15)	22 / 11 (30 / 15)	18.5 / 13 (25 / 17)	5.5 / 3.7 (7 / 5)
Taper spindle	-	BBT 40	HSK-A63	HSK-F63	HSK-E40

Spindle Cooling System

Cooling system removes heat generated at the bearings and motor to minimize thermal error. The air-oil structure supplies high pressure air and lubricant to the spindle bearings to remove the heat generated at the bearings and extend service life of the machine tool.





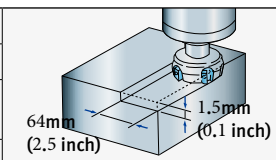
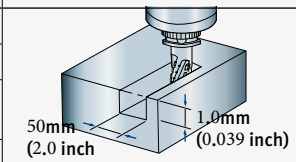
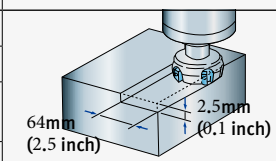
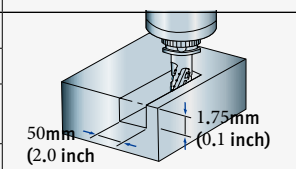
Cutting Performance

Delivers an excellent performance in diverse machining conditions.

Z Axis Fine Feeding

Machine		**NX 6500 Ⅱ**
Item		Pattern mold
Material		HP4M
Condition	**Tool**	F1 Ball Endmill
	Spindle speed / Feed rate	Speed : 19000 r/min Feed : 800mm/min (31.5 ipm)
	Time	134 hr

NX 5500 Ⅱ [20000 r/min]

Face mill (SM45C)			
Ø80mm (3.1 inch) Face mill (6Z)			
Machining removal rate cm³/min (inch³/min)	**Spindle speed** (r/min)	**Feed rate** mm/min (ipm)	
292 (17.8)	1750	3045 (155)	
R Cutter (NAK80)			
Ø50mm (2.0 inch) R cutter (3Z)			
Machining removal rate cm³/min (inch³/min)	**Spindle speed** (r/min)	**Feed rate** mm/min (ipm)	
115 (7)	1270	2290 (90)	
Face mill (GC25)			
Ø80mm (3.1 inch) Face mill (6Z)			
Machining removal rate cm³/min (inch³/min)	**Spindle speed** (r/min)	**Feed rate** mm/min (ipm)	
436 (26.6)	1750	2730 (107)	
R Cutter (NAK80)			
Ø50mm (2.0 inch) R cutter (3Z)			
Machining removal rate cm³/min (inch³/min)	**Spindle speed** (r/min)	**Feed rate** mm/min (ipm)	
101 (6.2)	960	1150 (45)	

* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Optimized Tool Processing Solution

Superior surface finishes and machining accuracy are achieved through using standard processing solutions such as high-speed / high-precision contour control and thermal displacement compensation.

High Speed / High Precision Contour Control

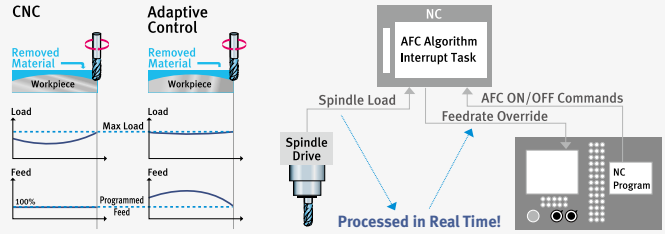
*DSQ : Doosan Super Quality

- **DSQ3**
  (DSQ2 + High speed processing _ 600 Block)

The Optimal Feed Control (DAFC*)

*DAFC : Doosan Adaptive Feedrate Control

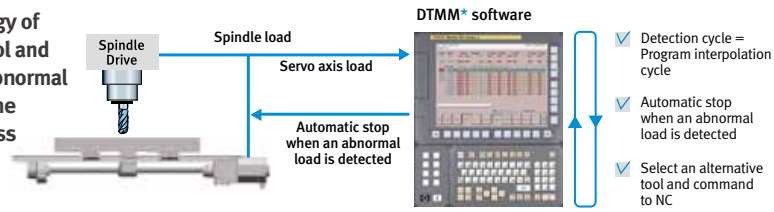
Optimal feed control is ensured by real-time spindle load detection.



Tool Load Monitoring System (DTMM*) option

*DTMM : Doosan Tool load Monitoring for Machining Centers

The technology of protecting tool and machine in abnormal load during the cutting process



Smart thermal displacement multi compensation technology (DSTC*)

*DSTC : Doosan Smart Thermal Control

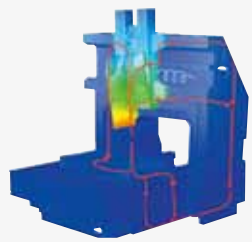
Realizes high-quality, high-precision machining with smoothing thermal displacement compensation of the spindle and structure.

Compensation of static displacement of spindle

Compensates changes in tool position caused by expansion of the spindle shaft at high speed.

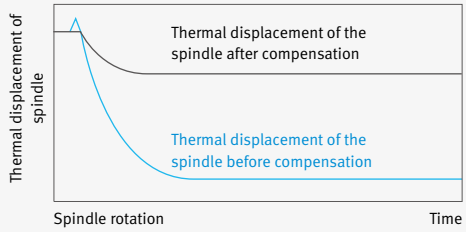
Structure thermal displacement compensation

Compensates irregular deflection or expansion of the structure due to ambient temperature using a multiple temperature sensors.



Compensation of structure thermal displacement

Thermal error of the spindle caused by heat accumulation is compensated with 5 algorithms including a smoothing function.



Standard/Optional Specifications

Diverse optional features are available to meet specific customer requirements.

● Standard ○ Optional X N/A

NO.	Description	Features	NX 5500 Ⅱ	NX 6500 Ⅱ
1	Air blower		●	●
2	Air gun		○	○
3	Auto NC power off		○	○
4	Auto workpiece measurement		○	○
5	Automatic tool changer	24 Tools	X	X
6		30 Tools	●	●
7	Automatic tool measurement	TS27R : RENISHAW	●	●
8	Automatic tool measurement master tool		○	○
9	Chip conveyor	Hinge / Scraper / Drum filter type	○	○
10	Coolant chiller		○	○
11	Coolant gun		○	○
12	Coolant Pump		●	●
13	Coolant Tank		●	●
14	DAFC		●	●
15	DSQ	DSQ3	●	●
16	DSTC		●	●
17	DTMM		○	○
18	Easy Operation Package	Tool load monitor	●	●
19		Alram / M-code / G-code / ATC recovery help	●	●
20		Table moving for setup / Easy work coordinate setting	●	●
21	Electric cabinet air conditioner		○	○
22	Electric cabinet light		○	○
23	Electric cabinet line filter		○	○
24	Gravity axis drop prevention		○	○
25	Linear scale	X Axis	○	○
26		Y Axis	○	○
27		Z Axis	○	○
28	MPG	1 MPG_PORTABLE TYPE	●	●
29		1 MPG_PORTABLE_W/ENABLE TYPE	○	○
30	NC System	FANUC 31iB	●	●
31		HEIDENHAIN iTNC530	○	○
32	NC system lcd size	10.4 inch_FANUC (Color)	●	●
33		15.1 inch_HEIDENHAIN (Color)	○	○
34	Oil Skimmer	Belt type	○	○
35	Power transformer		○	○
36	Spindle motor power	22 / 11 kW (30 / 15 Hp)	●	●
37		18.5 / 13 kW (25 / 17 Hp)	○	○
38		5.5 / 3.7 kW (7 / 5 Hp	○	○
39	Spindle speed	20000 r/min	●	●
40		30000 r/min	○	○
41		40000 r/min	○	○
42	Test bar		○	○
43	Through spindle coolant	NONE	●	●
44		1.5 kW (2 Hp)_2.0 MPA (2 Hp)	○	○
45		5.5 kW (7.4 Hp)_7.0 MPA_DUAL BAG FILTER	○	○
46	Work & tool counter	WORK / TOOL	○	○

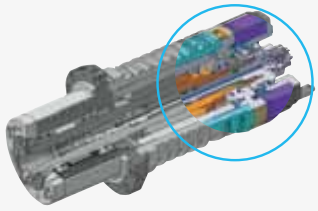
* Please contact Doosan for more information.

Optional Equipments

Deliver excellent performance on diverse machining conditions.

1.
Constant pre-load

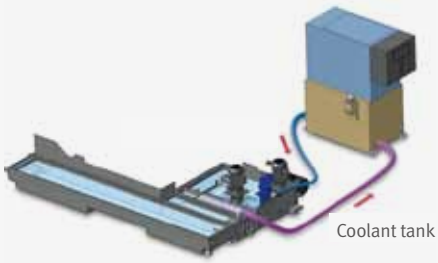
Constant pressure spindle for high rigidity in low speed range and long life in high speed range.



2.
Standard chip pan and chip disposal

Chips are discharged to left side via screw conveyor.

3.
Coolant chiller (strongly recommended) option



4.
Machine temperature controlled spindle and axis drive cooling system

Accurate spindle cooling
Accurate ball screw cooling

5.
Auto tool measuring equipment

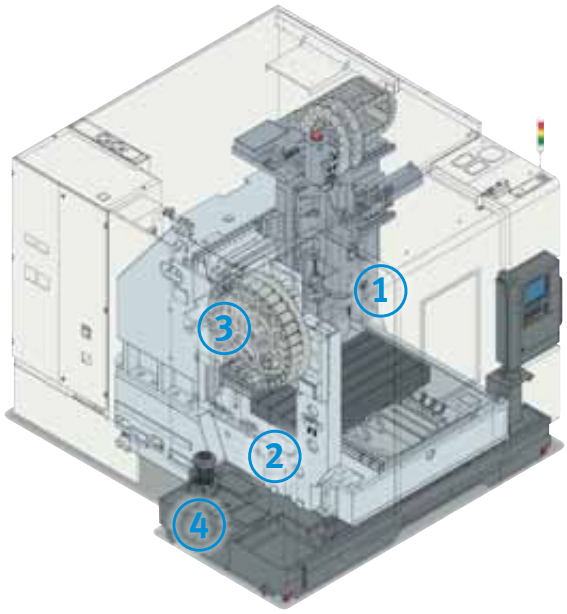
Tool length measurement
Tool diameter measurement
Damaged tool detection

6.
Graphite cutting solution option

Fine graphite powder sealing. Wet/dry chip disposal

Chip Disposal

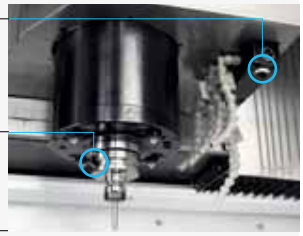
Through rapid discharge of chips, it maintains a high degree of efficient processing, and supports the operator to work in improved environment by providing a variety of chip treatment devices.



1. Coolant system

Side coolant chip air blower. Coolant residue stopping device

Spindle face coolant option



2. Screw conveyor

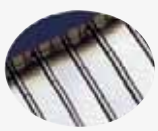
Two-rows screw type.

3. Barrier between the magazine and cutting area

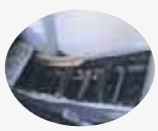
The tool storage of the magazine is protected from the cutting area with an automatic door.

4. Chip conveyor option

NX 6500 Ⅱ - Side discharge
NX 5500 Ⅱ - Rear discharge



Hinge type

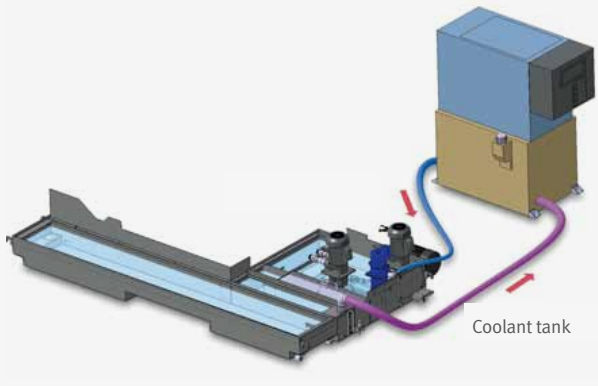


Scraper type

Drum filter type

Coolant Chiller (highly recommended) option

The coolant chiller lowers coolant temperature, helping to cool both the workpiece and tool during the machining operation. When using insoluble cutting oils, a coolant chiller is recommended to cool heated oil and preserve machining precision.

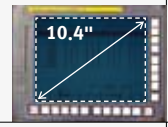


Convenience

Operator convenience and work efficiency have been improved with adoption of various convenient control functions and ergonomic design.

Operating console

1. 10.4" Color TFT LCD Monitor



2. Mono Lever

3. Membrane Keyboard

4. Portable MPG

LCD Portable MPG Handle

option

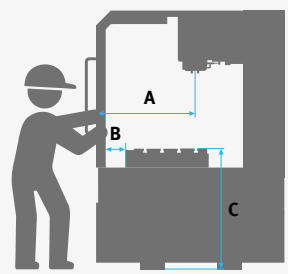
5. Hot Key

6. Swiveling Operation Panel

The operation panel can swivel up to 80° improving user convenience.

Excellent Accessibility

A	NX 5500 Ⅱ	mm (inch)	815 (32)
	NX 6500 Ⅱ	mm (inch)	930 (37)
B	NX 5500 Ⅱ	mm (inch)	265 (10)
	NX 6500 Ⅱ	mm (inch)	280 (11)
C	NX 5500 Ⅱ	mm (inch)	860 (34)
	NX 6500 Ⅱ	mm (inch)	780 (31)



Convenient Absolute Feed

The current position of the machine is stored and maintained using battery power. Zero point return is not necessary after a power cycle.

System Condition Indicator

Warning lamp
Reports abnormal operating condition of the machine

Work completion indicator
Indicates that the work is finished

In-progress lamp
Indicates that the work is being carried out

LED Indoor Work Light

LED lamp provides higher brightness and longer life with reduced energy consumption.

Easy Operation Package

These Doosan software packages have been customized to provide fast and easy setup of tooling, workpiece, and program. These functions minimize the idle time caused by process setup and maximize the machine's productivity.

Adaptive Feed Control (AFC)

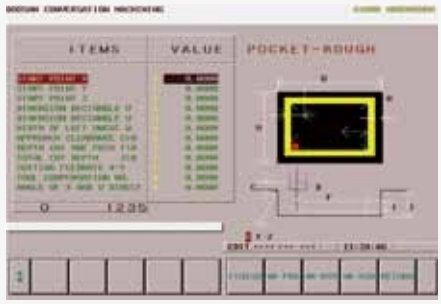
Function to control feedrate so that the cutting can be carried out at a constant load (To adapt to the spindle load set up with constant load feedrate control function)

Tool Management

Function to manage tool information [Tool information / Tool No. / Tool condition (normal, large diameter, worn / damaged, used for the first time, manual) / Tool name]

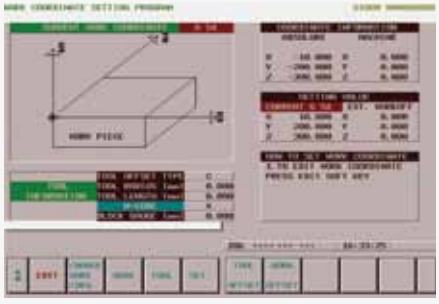
Tool Load Monitor

Function to automatically monitor tool load (Different loads can be set for one tool according to M700 ~ M704)



Pattern Cycle & Engraving

Function to create frequently-used cutting programs automatically
Pattern Cycle: creates a program for a pre-defined shape
Engraving: creates a program for cutting a shape described with characters (option) option



Work Offset Setting

Function to configure various work offset settings

Alarm Guidance

Function to show detailed info on frequently triggered alarms and recommended actions

Sensor Status Monitor

Function to view sensor conditions of the machine

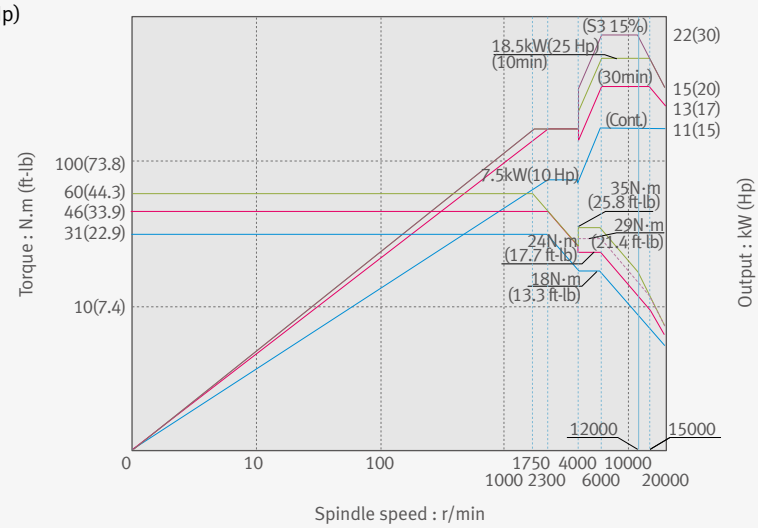
ATC Recovery

Function to view detailed info with recommended actions and to perform step-by-step operation manually (when an alarm is triggered during an ATC operation)

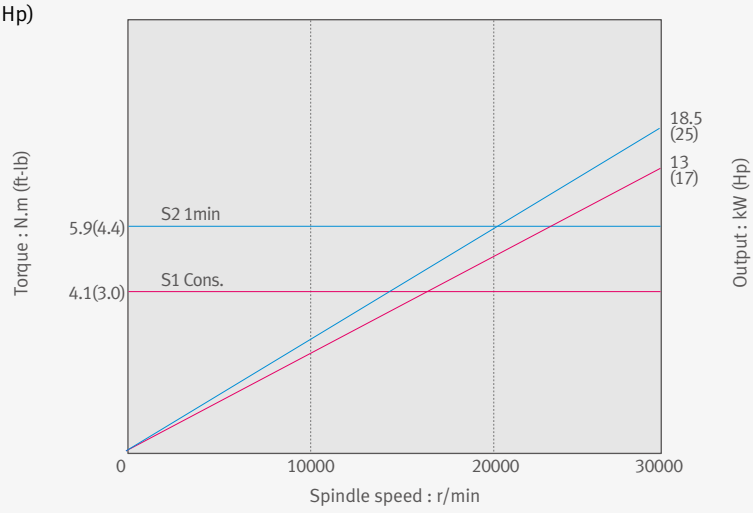
Spindle Power – Torque Diagram

NX 5500 Ⅱ / 6500 Ⅱ

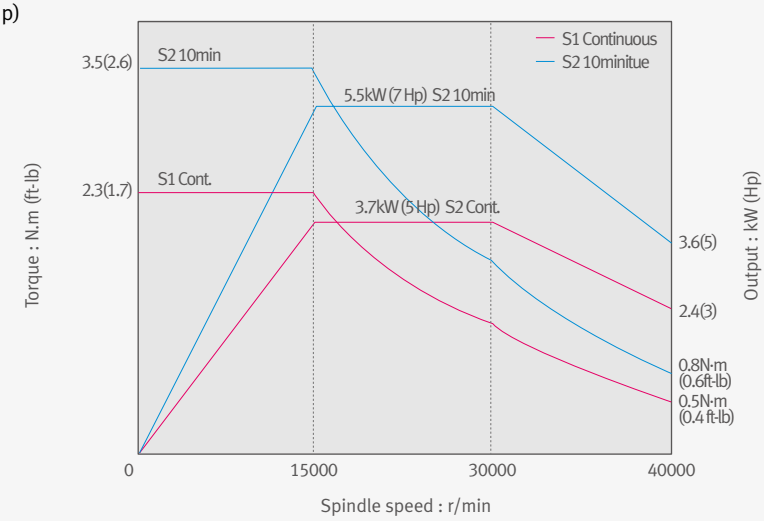
Max. spindle speed : 20000 r/min
Spindle motor power : 22 kW (30 Hp)
Taper : ISO #40



Max. spindle speed : 30000 r/min
Spindle motor power : 18.5 kW (25 Hp)
Taper : HSK F63 option



Max. spindle speed : 40000 r/min
Spindle motor power : 5.5 kW (7 Hp)
Taper : HSK E40 option

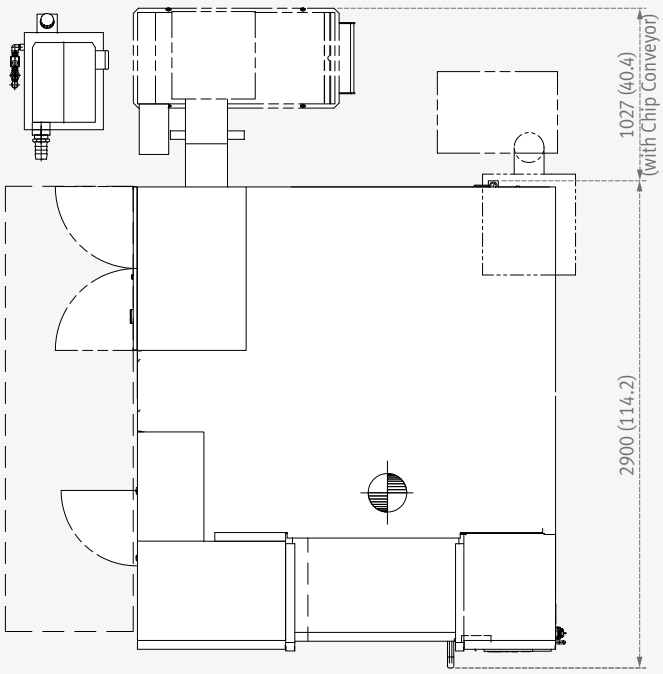


External Dimensions

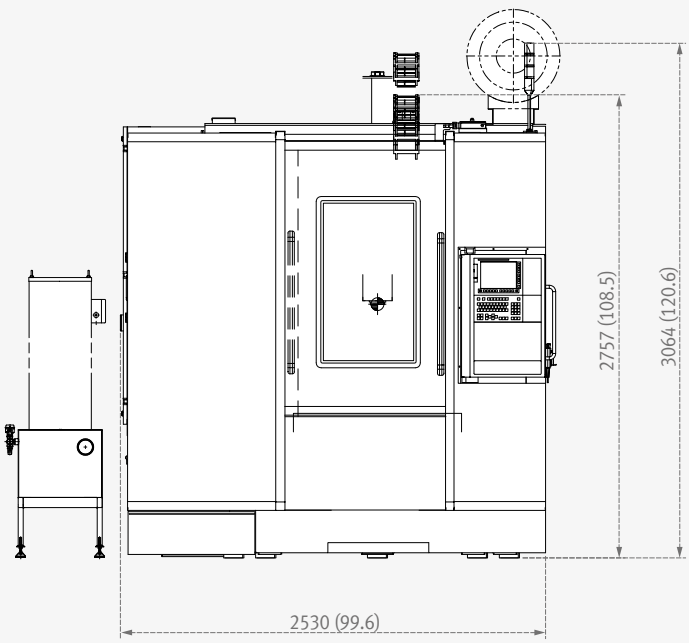
NX 5500 II

Unit: mm (inch)

Top View



Front View

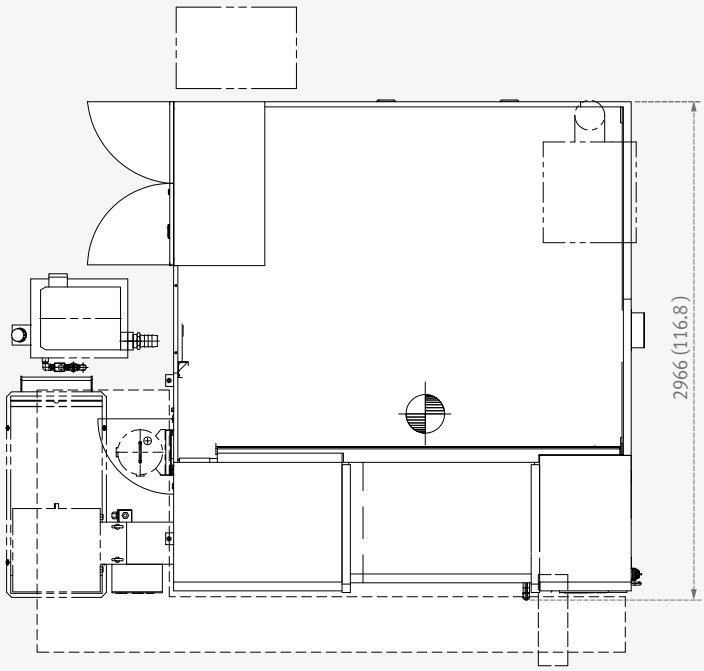


External Dimensions

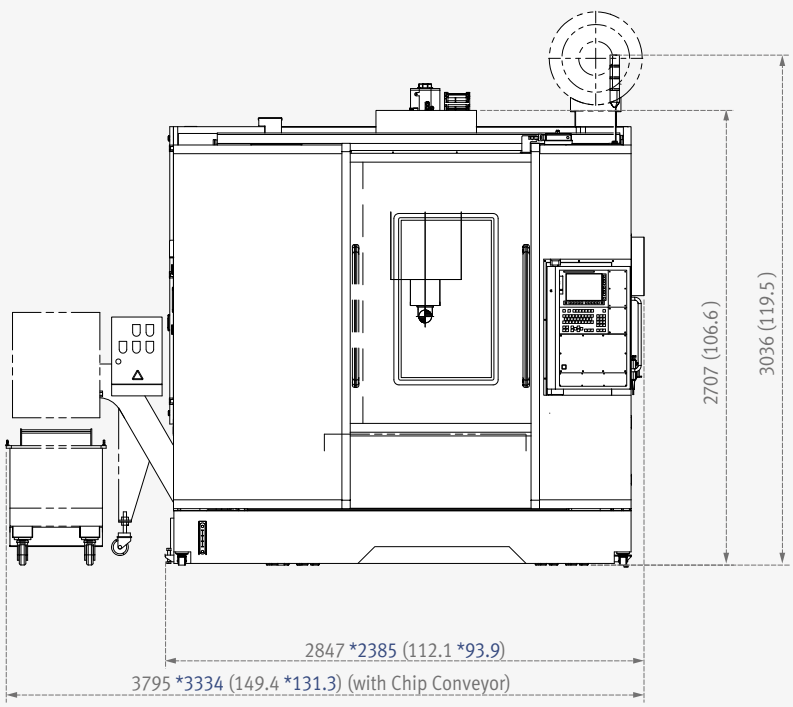
NX 6500 Ⅱ

Unit : mm (inch)

Top View



Front View

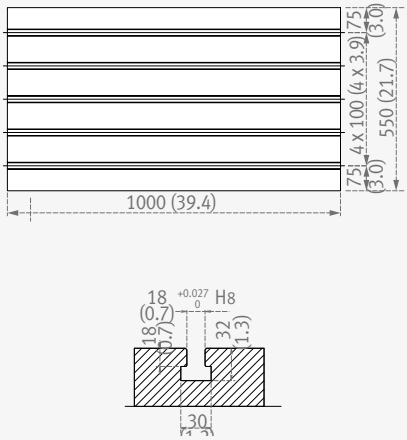


External Dimensions

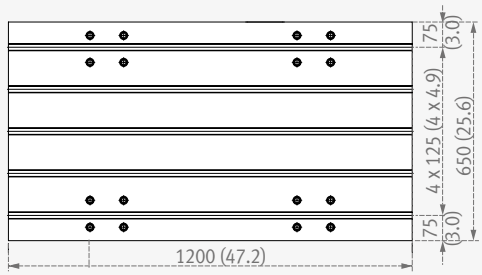
Table dimensions

Unit: mm (inch)

NX 5500 Ⅱ



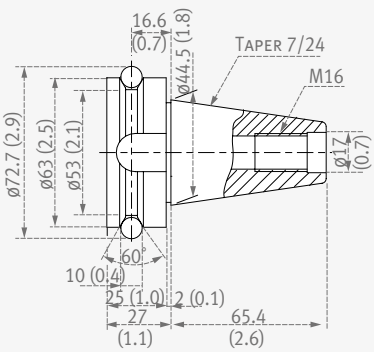
NX 6500 Ⅱ



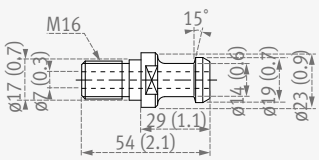
Tool shank

Unit: mm (inch)

20000 r/min

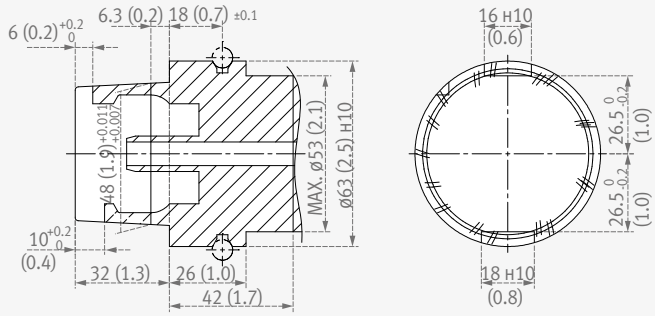


MAS 403 BT40



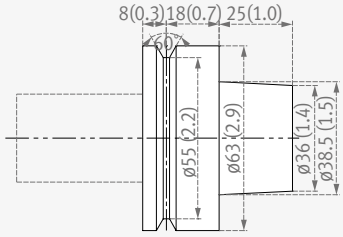
PS-806 (NIKKEN)

20000 r/min option



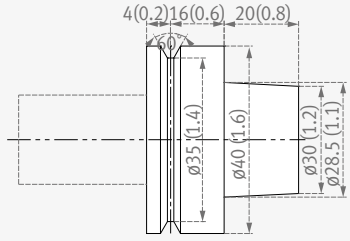
HSK A63

30000 r/min option



DIN 69893 HSK-F63

40000 r/min option



DIN 69893 HSK-E40

Machine Specifications

Item		Unit	NX 5500 Ⅱ	NX 6500 Ⅱ
Travels	X, Y, Z axis	mm (inch)	900 / 550 / 500 (35.4 / 21.7 / 19.7)	1050 / 650 / 550 (41.3 / 25.6 / 21.7)
	Distance from spindle nose to table top	mm (inch)	150 ~ 650 (5.9 ~ 25.6)	150 ~ 700 (5.9 ~ 27.6)
Feedrates	Rapid traverse (X / Y / Z axis)	m/min (ipm)	30 / 30 / 30 (1181.1)	
	Cutting feedrate	m/min (ipm)	15 (590.6)	
Table	Table size	mm (inch)	1000 x 550 (39.4 x 21.7)	1200 x 650 (47.2 x 25.6)
	Table loading capacity	Kg (lb)	700 (1543.2)	800 (1763.7)
Spindle	Max. spindle speed	r/min	20000 {30000, 40000}*	
	Spindle motor (10min/cont.)	kW (Hp)	22 / 11 (29.5 / 14.8) {18.5 / 13 (24.8 / 17.4), 5.5 / 3.7 (7.4 / 5.0)}*	
	Taper spindle	Taper	ISO #40 7/24 {HSK-F63, HSK-E40}*	
	Max. spindle torque (10min)	N.m (ft-lbs)	60 (44.3) {5.9, 3.5 (4.3, 2.6)}*	
Automatic Tool Changer	Number of tools	ea	30	30
	Max. tool diameter	mm (inch)	80 (3.1)	
	Max. tool diameter without adjacent tools	mm (inch)	125 (4.9)	
	Max. tool length	mm (inch)	220 (8.7)	250 (9.8)
	Max. tool weight	Kg (lb)	7 (15.4)	8 (17.6)
	Tool change time (tool-to-tool)	s	1.6	
Power Source	Electric power supply	kVA	46.6 {43, 31}*	48.6 {47, 35}*
Tank Capacity	Coolant tank capacity	L (gal)	230 (60.8)	
	Lubrication tank capacity	L (gal)	3.0 (0.8)	4.3 (1.1)
Machine DeMnsions	Length x Width	mm (inch)	2530 x 2900 (99.6 x 114.2)	2847 x 2966 (112.1 x 116.8)
	Height	mm (inch)	3064 (120.6)	3036 (119.5)
	Weight	Kg (lb)	9000 (19841.3)	10000 (22046.2)
NC system		-	FANUC 31i {HEIDENHAIN}*	

* { } : Option

NC Unit Specifications

● Standard ○ Optional X N/A

FANUC

No.	Item		Spec.	FANUC 31i
1	AXES CONTROL	Controlled axes	3 (X, Y, Z)	X, Y, Z
2		Additional controlled axes	5 axes in total	○
3		Least command increment	0.001 mm / 0.0001"	●
4		Interpolation type pitch error compensation		○
5	INTERPOLATION & FEED FUNCTION	2nd reference point return	G30	●
6		3rd / 4th reference return		○
7		Inverse time feed		○
8		Cylinderical interpolation	G07.1	○
9		Helical interpolation B	Only Fanuc 30i	-
10		Smooth interpolation		○
11		NURBS interpolation		○
12		Involute interpolation		○
13		Helical involute interpolation		○
14		Bell-type acceleration/deceleration before look ahead interpolation		○
15		Automatic corner override	G62	○
16		Manual handle feed	Max. 3unit	1 unit
17		Manual handle feed rate	x1, x10, x100 (per pulse)	●
18		Handle interruption		●
19		Manual handle retrace		○
20		Manual handle feed 2/3 unit		○
21		Nano smoothing	AI contour control II is required.	○
22		AI APC	20 BLOCK	X
23		AICC I	30 BLOCK	X
24		AICC I	40 BLOCK	-
25		AICC II	200 BLOCK	X
26		AICC II	400 BLOCK	X
27		High-speed processing	600 BLOCK	●
28		Look-ahead blocks expansion	1000 BLOCK	○
29		DSQ I	AICC II (200block) + Machining condition selection function	X
30		DSQ II	AICC II (200block) + Machining condition selection function + Data server(1GB)	X
31		DSQ III	AICC II with high speed processing (600block) + Machining condition selection function + Data server(1GB)	●
32	SPINDLE & M-CODE FUNCTION	M- code function		●
33		Rigid tapping	G84, G74	●
34	TOOL FUNCTION	Number of tool offsets	64 ea	64 ea
35		Number of tool offsets	99 ea	○
36		Number of tool offsets	200 ea	○
37		Number of tool offsets	400 ea	○
38		Number of tool offsets	499 / 999 / 2000 ea	○
39		Tool nose radius compensation	G40, G41, G42	●
40		Tool length compensation	G43, G44, G49	●
41		Addition of tool pairs for tool life management		○
42		Tool offset	G45 - G48	○
43	PROGRAMMING & EDITING FUNCTION	Custom macro		●
44		Part program storage	256KB (640m)	640m
45		Part program storage	512KB(1,280m)	○
46		Part program storage	1MB(2,560m)	○
47		Part program storage	2MB(5,120m)	○
48		Part program storage	4MB(1,0240m)	○
49		Part program storage	8MB(2,0480m)	○
50		Inch/metric conversion	G20 / G21	●
51		Number of Registered programs	400 ea	-
52		Number of Registered programs	500 ea	500 ea
53		Number of Registered programs	1000 ea	○
54		Number of Registered programs	4000 ea	○
55		Optional block skip	9 BLOCK	○
56		Program number	O4-digits	-
57		Playback function		○
58		Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	48 pairs
59		Addition of workpiece coordinate system	G54.1 P1 - 300 (300 pairs)	○
60	OTHERS FUNCTIONS (Operation, setting & Display, etc)	High speed skip function		○
61		Polar coordinate command	G15 / G16	○
62		Polar coordinate interpolation	G12.1 / G13.1	○
63		Programmable mirror image	G50.1 / G51.1	○
64		Scaling	G50, G51	○
65		Single direction positioning	G60	○
66		Pattern data input		○
67		Jerk control	AI contour control II is required.	○
68		Fast Data server with1GB PCMCIA card		●
69		Fast Ethernet		○
70		3-dimensional coordinate conversion		○
71		3-dimensional tool compensation		○
72		Figure copying	G72.1, G72.2	○
73		Machining time stamp function		○
74		EZ Guide I with 10.4" Color TFT	Doosan infracore Conversational Programming Solution -.When the EZ Guide i is used, the Dynamic graphic display cannot application	○
75		Dynamic graphic display (with 10.4" Color TFT LCD)	Machining profile drawing. -.When the EZ Guide i is used, the Dynamic graphic display cannot application	○

NC Unit Specifications

HEIDENHAIN

● Standard ○ Optional X N/A

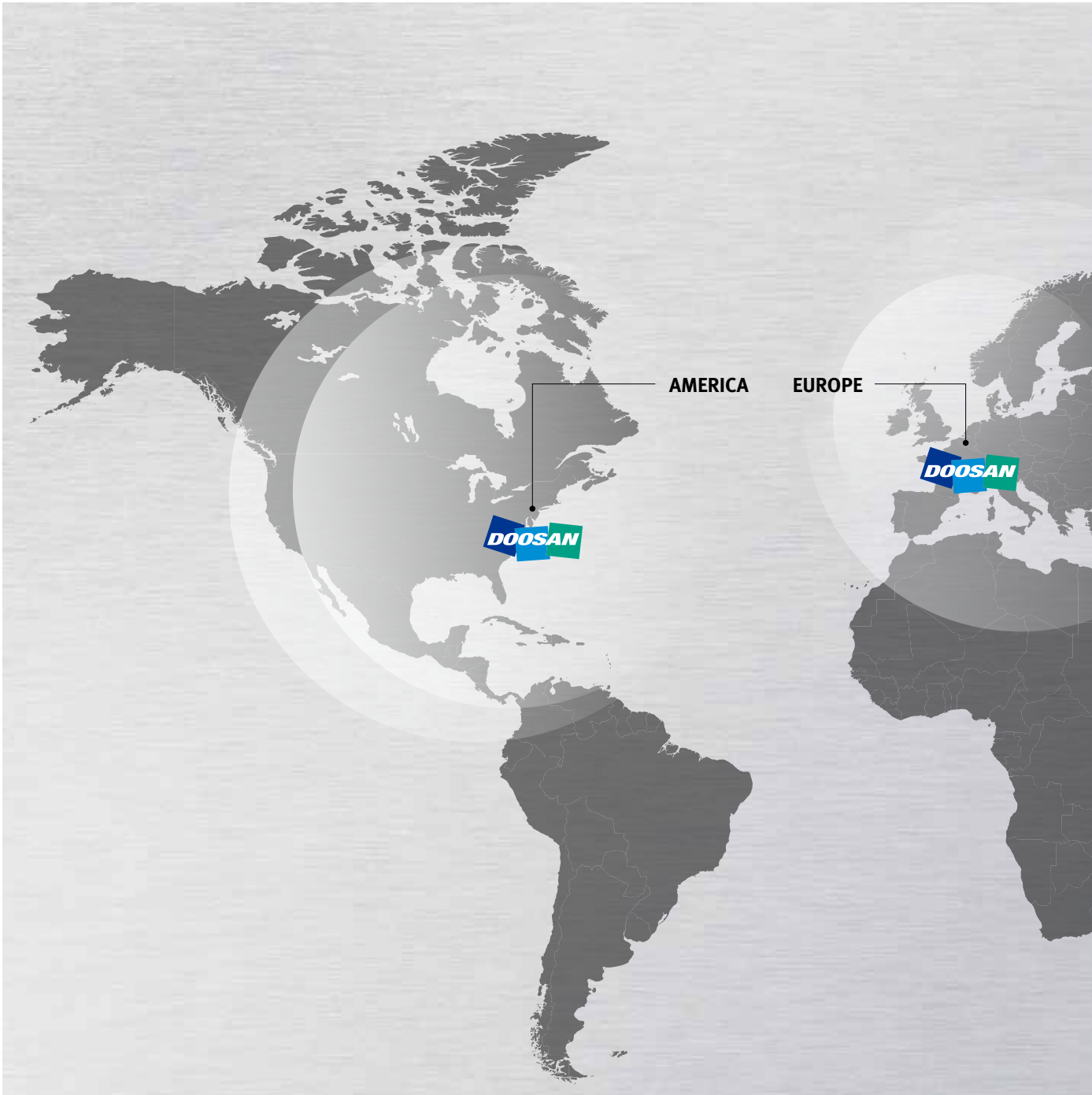
No.	Item		Spec.	iTNC 530
1	Axes	Controlled axes	3 axes	X, Y, Z
2			4 axes	○
3			5 axes	X
4		Additional controlled axes	6 axes	X
5		Controlled axes	Max. 18 axes in total	○
6		Least command increment	0.0001 mm (0.0001 inch), 0.0001°	●
7		Least input increment	0.0001 mm (0.0001 inch), 0.0001°	●
8		Maximum commandable value	±99999.999mm (±3937 inch)	●
9		Axis feedback control	Double-speed control loops for high-frequency spindles and torque/linear motors	○
10		MDI / DISPLAY unit	15.1 inch TFT color flat panel	●
11			19 inch TFT color flat panel	○
12		Program memory for NC programs	SSDR	21GB
13		Block processing time		0.5 ms
14		Cycle time for path interpolation	CC 61xx	3 ms
15		Encoders	Absolute encoders	EnDat 2.2
16	Commissioning and diagnostics	Data interfaces	Ethernet interface	●
17			USB interface (USB 2.0)	●
18	Machine functions	Look-ahead	Intelligent path control by calculating the path speed ahead of time (max. 1024 blocks.)	●
19		HSC filters		●
20		Switching the traverse ranges		●
21	User functions	Program input	According to ISO	●
22			With smarT.NC	●
23			With smartSelect	X
24		Position entry	Nominal positions for lines and arcs in Cartesian coordinates	●
25			Incremental or absolute dimensions	●
26			Display and entry in mm or inches	●
27			Display of the handwheel path during machining with handwheel superimpositioning	●
28			Paraxial positioning blocks	●
29		Tool compensation	In the working plane and tool length	●
30			Radius-compensated contour lookahead for up to 99 blocks (M120)	●
31			Three-dimensional tool radius compensation	●
32		Tool table	Central storage of tool data	●
33			Multiple tool tables with any number of tools	●
34		Cutting-data table	Calculation of spindle speed and feed rate based on stored tables	●
35		Constant contouring speed	relative to the path of the tool center or to the tool's cutting edge	●
36		Parallel operation	Creation of a program while another program is being run	●
37		Tilting the working plane with Cycle 19		○
38		Tilting the working plane with the PLANE function		○
39		Manual traverse in tool-axis direction	after interruption of program run	●
40		Function TCPM	Retaining the position of tool tip when positioning tilting axes	●
41		Rotary table machining	Programming of cylindrical contours as if in two axes	○
42			Feed rate in distance per minute	○
43		FK free contour programming	for workpieces not dimensioned for NC programming	●
44		Program jumps	Subprograms and program section repeats	●
45			Calling any program as a subprogram	●
46		Program verification graphics	Plan view, view in three planes, 3-D view	●
47			3-D line graphics	X
48		Programming graphics	3-D line graphics	●

HEIDENHAIN

● Standard ○ Optional X N/A

No.	Item		Spec.	iTNC 530
49	User functions	Program-run graphics	(plan view, view in three planes,3-D view)	●
50		Datum tables	Saving of workpiece-specific datums	●
51		Preset table	Saving of reference points	●
52		Freely definable table	after interruption of program run	●
53		Returning to the contour	With mid-program startup	●
54			After program interruption (with the GOTO key)	●
55		Autostart		●
56		Actual position capture		●
57		Enhanced file management		●
58		Context-sensitive help for error messages		●
59		TNCguide	Browser-based, context-sensitive helpsystem	●
60		Calculator		●
61		Entry of text and special characters		●
62		Comment blocks in NC program		●
63		"Save As" function		●
64		Structure blocks in NC program		●
65		Entry of feed rates	FU (feed per revolution)	●
66			FZ (tooth feed per revolution)	●
67			FT (time in seconds for path)	●
68			FMAXT (only for rapid traverse pot: time in seconds for path)	●
69		Dynamic collision monitoring (DCM)		○
70		Fixture monitoring		○
71		Processing DXF data		○
72		Global program settings (GS)		○
73		Adaptive feed control (AFC)		○
74		KinematicsOpt	Automatic measurement and optimization of machine kinematics	○
75		KinematicsComp	Three-dimensional compensation	○
76		3D-ToolComp	Dynamic 3-D tool radius compensation	○
77		FUNCTION MODE TURN	Switchover to turning mode	X
78		FUNCTION MODE MILL	Switchover to milling mode	X
79		TOOLTURN.TRN	Tool table for turning tools	X
80		Tool compensation for turning		X
81		FUNCTION TURNDATA SPIN VCONST ON VC:253	Constant surface speed with optional spindle speed limiting	X
82		FUNCTION TURNDATA BLANK	Blank-form update during turning	X
83		GRV AXIAL, GRV RADIAL	Undercut as contour element	X
84		UDC TYPE	Recess as contour element, types E, F, H, K, U, threads	X
85		Imbalance monitoring	Cycles for determining and monitoring imbalance	X
86	Fixed cycles	Working plane	Cycle 19	○
87		Cylinder surface	Cycle 27	○
88		Cylinder surface slot milling	Cycle 28	○
89		Cylinder surface ridge milling	Cycle 29	○
90	Touch probe cycles	Calibrating the effective radius on a circular stud		X
91		Calibrating the effective radius on a sphere		X
92	Cycles for automatic workpiece inspection	Calibrate TS		●
93		Calibrate TS length		●
94		Measure axis shift		●
95		Save kinematics		○
96		Measure kinematics		○
97		Preset compensation		○
98	Options	Software option 1		○
99		Rotary table machining	Programming of cylindrical contours as if in two axes	
100			Feed rate in mm/min	
101		Coordinate transformation	Tilting the working plane, PLANE function	
102		Interpolation	Circular in 3 axes with tilted working plane	
103		Software option 2		○
104		3-D machining	3-D tool compensation through surface normal vectors	
105			Tool center point management (TCPM)	
106			Keeping the tool normal to the contour	
107			Tool radius compensation normal to the tool direction	
108		Interpolation	Line in 5 axes (subject to export permit)	
109			Spline: execution of splines (3rd degree polynomial)	

Responding to Customers Anytime, Anywhere



Global Service Support Network

Corporations	Dealer Networks	Technical Centers	Factories
4	122	18	3

Technical Center: Sales Support, Service Support, Parts Support

Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands. By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.

Domestic Service Support Network

Integrated Support Centers	Sales Branch Offices	Post-Sales Service Centers	Designated Repair Service Centers
2	7	6	31

Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.

Supplying Parts

- Supplying a wide range of original Doosan spare parts
- Parts repair service

Field Services

- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair

Technical Support

- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy

Training

- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering

Major Specifications

NX Ⅱ series

Description	UNIT	NX 5500 Ⅱ	NX 6500 Ⅱ
Max. spindle speed	r/min	20000	
Spindle motor power	kW (hp)	22 / 11 (30 / 15)	
Taper spindle	Taper	ISO #40 7/24	
Travels (X, Y, Z)	mm (inch)	900 / 550 / 500 (35.4 / 21.7 / 19.7)	1050 / 650 / 550 (41.3 / 25.6 / 21.7)
Number of tools	ea	30	30
Table size	mm (inch)	1000 x 550 (39.4 x 21.7)	1200 x 650 (47.2 x 25.6)
NC system	-	FANUC 31i	

Doosan Machine Tools

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* The specifications and information above-mentioned may be changed without prior notice.